

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated November 17, 2003. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 3-10, 15-18, and 20-21 are under consideration in this application. Claims 3-10 and 15 are being amended, as set forth above in the marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention.

Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 3-10, 15-18 and 20-21 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over an article by Ronaghi et al. (*Science*, pp. 363-365; hereinafter "Ronaghi") and U.S. Pat. No. 6,387,234 to Yeung et al. (hereinafter "Yeung"). This rejection has been carefully considered, but is most respectfully traversed.

The system for obtaining nucleic acid sequence information (claim 3) or the nucleic acid analyzing system (claim 15) according to the invention, comprises: a reaction vessel 10; a first capillary (e.g., 6 in Fig. 2) or groove (e.g., 12 in Fig. 1) supplying dATP into the reaction vessel by pressurizing or by a liquid transfer system; a second capillary or groove supplying dGTP into the reaction vessel by pressurizing or by a liquid transfer system; a third capillary or groove supplying dCTP into the reaction vessel by pressurizing or by a liquid transfer system; a fourth capillary or groove supplying dTTP into the reaction vessel by pressurizing or by a liquid transfer system; and a detector monitoring synthesis of a strand complementary to a template nucleic acid by detecting chemiluminescence which arises from reaction with ATP and luciferin in the presence of luciferase at the reaction vessel the ATP being converted from pyrophosphate produced from the synthesis which uses one of the dATP, the dGTP, the dCTP and the

dTTP (page 2, lines 28-29). In particular, the template nucleic acid is set in the reaction vessel.

The present invention described in claims 3 and 15 is characterized in that the sequence of the template nucleic acid set in the reaction vessel is detected by supplying each of dATP, dGTP, dCTP and dTTP into the same reaction vessel via the corresponding first, second, third or fourth capillary or groove. Such a construction is unique and completely new.

Applicants respectfully contend neither Ronaghi nor Yeung teaches or suggests "detecting the sequence of the template nucleic acid set in the reaction vessel by supplying each of dATP, dGTP, dCTP and dTTP into the same reaction vessel via the corresponding first, second, third or fourth capillary or groove." This characteristic provides a compact, simple, convenient and unique system for obtaining nucleic acid sequencing information or analyzing nucleic acid sequence (p. 4, 2nd paragraph of the original specification). The dATP, dGTP, dCTP and dTTP are deoxyribonucleotides, i.e., nucleotides that contain deoxyriboses (a pentose sugar C₅H₁₀O₄) and are constituents of DNA¹.

As admitted by the Examiner on page 4, second paragraph, of the outstanding Office Action, Ronaghi does not teach how the dNTPs are supplied or the use of any capillaries. Yeung was relied upon by the Examiner to compensate for Ronaghi's deficiencies. However, Yeung only describe an integrated multiplexed capillary electrophoresis system for the analysis of sample analytes in parallel (Abstract). As pointed out by the Examiner, the number of intake capillaries 3 employed in Yeung's system is directly related to the number of samples analysis "channels" in the system (e.g., *more than five* in Fig. 3, i.e., the more the better; col. 8, lines 17-20), rather than the kinds of nucleotides that are constituents of DNAs (**only four** kinds). Yeung defines a "sample" as a native or untreated sample, a chemically or biologically pre-treated or reacted sample, or a reaction mixture of a native sample and one or more added components useful in the analysis of the sample (col. 5, lines 45-48). Accordingly, Yeung's "sample" dose not include dATP, dGTP, dCTP or dTTP.

Furthermore, as further pointed out by the Examiner, each intake capillary 3 of Yeung optionally comprises a reaction portion 8 (col. 8, lines 46-47; col. 14, lines 50-53; Figs. 5A-C) which permits mixing and reaction steps (col. 8, lines 48-50). In other words, each intake capillary itself individually comprise a reaction portion/vessel, rather than guiding the solution therein to the same reaction vessel as the invention. Therefore, the structure of Yeung's intake capillaries and the respective reaction portions are completely different from the capillaries or grooves and the reaction vessel of the invention.

¹ Merriam-Webster's Online Dictionary, 10th Edition.
<http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=deoxyribonucleotide>

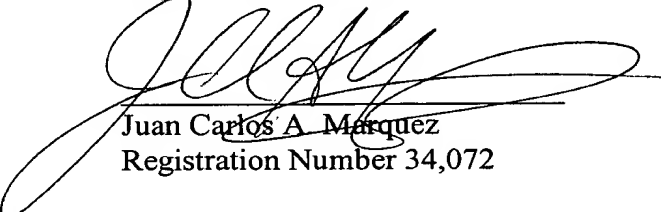
Accordingly, Applicants contend that the suggested combination does not embody each and every feature of the present invention as now claimed in claims 3 and 15 from which claims 4-10, 16-18, and 20-21 depend. The difference is more than sufficient that the present invention as now claimed would not have been rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely. Therefore, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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